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10/591,089	05/21/2007	Johannes Reinschke	2005P00319WOUS	7808

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EXAMINER	
ANDREWS, MICHAEL	

ART UNIT	PAPER NUMBER
2834	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/591,089	REINSCHKE ET AL.	
	Examiner	Art Unit	
	MICHAEL ANDREWS	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 October 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7,9-11 and 13-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7,9-11 and 13-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

This Office Action is responsive to the Applicant's communication filed September 28, 2010. In virtue of this communication and the amendment concurrently filed, claims 7, 9-11, and 13-26 are now pending in the instant application.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 18, 2010 has been entered.

Response to Arguments

1. Applicant's arguments with respect to claims 7, 13, and 20 have been considered but are moot in view of the new ground(s) of rejection.

The argument states that none of the applied prior art references disclose a leaf spring which is pre-tensioned when the armature part is at its equilibrium position. The Applicant cites paragraph 9 of the original specification as providing support for this limitation, but said paragraph mentions nothing of pre-tensioning the spring. The original specification does discuss pre-tensioning the spring ([0020] and [0021] of the original specification), though it is in regard to both the invention and the prior art.

Claim Rejections - 35 USC § 112

2. Claims 7, 9-11, and 13-26 are rejected under 35 U.S.C. **112, first paragraph**, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 7, 13, and 20 define the "center position", where the armature is aligned with the yoke, as also being the "equilibrium position", where there are no active spring forces. However, [0021] clearly states that "in the rest position in which the spring forces are not acting, the armature is displaced from its centre position". The prior art has been applied using the meanings defined in the claims, where the springs are in equilibrium when the armature is aligned with the center position.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 7, 9-10, 13-17, 19-23, and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zabar (US 6,323,568 B1) in view of Rumswinkel (DE 1146578) and the Applicants' admitted prior art, hereinafter referred to as "AAPA".

With regard to claim 7, Zabar discloses a linear drive unit [2] (figures 1-3) comprising:

a yoke body [10, 20] having an exciter winding [15, 25] providing a magnetic field (col. 3, lines 12-24);

a magnetic armature part [30-34] which is set in linear oscillating motion about a center position in an axial direction by the magnetic field of the winding (col. 3, lines 36-40), the center position being the equilibrium position the armature part [30-34] adopts when oscillating between its maximum lateral deflection positions (figure 3; the armature is shown with the springs un-deflected), wherein a center of the armature [30-34] is aligned with a center of the yoke body [10, 20] in the center position (figure 3); and

a spring [40-45] having a fixed end [42, 43] clamped in a fixed manner in a clamped position with respect to the yoke body [10 ,20] and an oscillating end [41] coupled to the armature part [30-34] at a point of application and acting on the armature part [30-34] in the direction of motion (col. 4, lines 30-36);

wherein the spring [40-45] is configured as a leaf spring tensioned transverse to the direction of movement of the armature part (figures 3 and 5; col. 4, lines 21-29).

Except that Zabar does not expressly disclose that, in the center position of the armature part, the point of application of the spring on the armature part being displaced axially by a predetermined distance in relation to its clamping position, or that when the armature part is at the equilibrium position the spring is pre-tensioned.

Rumswinkel discloses a linear drive unit (col. 1, lines 1-5 and figures 1-3) comprising a yoke body [1] having an exciter winding providing a magnetic field (see col. 1, lines 5-10), a magnetic armature part [2, 3] which is set in linear oscillating motion about a center position in an axial direction (reference [20] designates the direction of movement) by the magnetic field of the winding (col. 1, lines 10-19);

wherein, in the center position of the armature part [2, 3], the point of application [42] of the spring [4] on the armature part [2, 3] being displaced axially by a predetermined distance in relation to the clamped position [41] (figures 2-3; in its equilibrium position, the armature is displaced by distance [b]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the linear drive unit of Zabar by offsetting the armature part as taught by Rumswinkel, for improving the efficiency thereof, since Rumswinkel teaches that such a drive unit minimizes the air gap between the magnetic components (col. 1, lines 25-32).

The AAPA discloses that armature parts should be pre-tensioned laterally in the movement direction (see [0020]). It would have been obvious to one of ordinary skill in

the art when the invention was made to implement the springs of Zabar by pre-tensioning them as taught by the AAPA, since pre-tensioning the springs was commonly known in linear drives used with compressors ([0020]).

With regard to claim 9, the combination of Zabar, Rumswinkel, and the AAPA discloses the drive unit according to claim 7, as stated above, further comprising a plurality of springs [40-45] disposed on each side of the center position (figures 3-4; col. 3, lines 60-67; each spring [40] comprises two leaf springs [44, 45]).

With regard to claim 10, the combination of Zabar and the AAPA discloses the drive unit according to claim 7, as stated above, wherein the armature part [30] is connected to a plunger [3] of a compressor [4, 5, 6] (col. 2, line 62 through col. 3, line 3).

Except that Zabar does not expressly disclose that, in the center position of the armature part, the point of application of the spring on the armature part being displaced axially by a predetermined distance in relation to its clamping position, and the axial displacement of the point of application of the spring on the armature part being provided in the direction away from the compressor.

Rumswinkel discloses the drive unit according to claim 7, as stated above, where the armature part is displaced axially in relation to its clamping position.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the linear drive unit of Zabar by offsetting the armature part away from the compressor as taught by Rumswinkel, for improving the

efficiency thereof, since Rumswinkel teaches that such a drive unit minimizes the air gap between the magnetic components (see col. 1, lines 25-32).

With regard to claim 13, Zabar discloses a linear drive unit [2] (figures 1-3) comprising:

a yoke body [10, 20] having an exciter winding [15, 25] providing a magnetic field (col. 3, lines 12-24);

a magnetic armature part [30-34] which is set in linear oscillating motion about a center position in an axial direction by the magnetic field of the winding (col. 3, lines 36-40), the center position being the equilibrium position the armature part [30-34] adopts when aligned with the center of the yoke body [10, 20] in which the armature [30-34] may symmetrically oscillate relative to the yoke body [10, 20] between its maximum lateral deflection positions (figure 3; the armature is shown with the springs un-deflected), wherein a center of the armature [30-34] is aligned with a center of the yoke body [10, 20] in the center position (figure 3); and

a spring [40-45] fixed with respect to the yoke body [10 ,20] at a clamped position [42, 43] and an oscillating end [41] coupled to the armature part [30-34] at a point of application and acting on the armature part [30-34] in a direction of motion (col. 4, lines 30-36).

Except that Zabar does not expressly disclose that, in the center position of the armature part, the point of application of the spring on the armature part being displaced axially by a predetermined distance in relation to its clamping position, or that when the armature part is at the equilibrium position the spring is pre-tensioned.

Rumswinkel discloses a linear drive unit (col. 1, lines 1-5 and figures 1-3) comprising a yoke body [1] having an exciter winding providing a magnetic field (see col. 1, lines 5-10), a magnetic armature part [2, 3] which is set in linear oscillating motion about a center position in an axial direction (reference [20] designates the direction of movement) by the magnetic field of the winding (col. 1, lines 10-19);

wherein, in the center position of the armature part [2, 3], the point of application [42] of the spring [4] on the armature part [2, 3] being displaced axially by a predetermined distance in relation to its clamping position [41] (figures 2-3; in its equilibrium position, the armature is displaced by distance [b]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the linear drive unit of Zabar by offsetting the armature part as taught by Rumswinkel, for improving the efficiency thereof, since Rumswinkel teaches that such a drive unit minimizes the air gap between the magnetic components (col. 1, lines 25-32).

The AAPA discloses that armature parts should be pre-tensioned laterally in the movement direction (see [0020]). It would have been obvious to one of ordinary skill in the art when the invention was made to implement the springs of Zabar by pre-tensioning them as taught by the AAPA, since pre-tensioning the springs was commonly known in linear drives used with compressors ([0020]).

With regard to claim 14, the combination of Zabar, Rumswinkel, and the AAPA discloses the drive unit according to claim 13, as stated above, wherein the spring [40-

45] is configured as a spring tensioned transverse to the direction of movement of the armature part (figures 3 and 5; col. 4, lines 21-29 of Zabar).

With regard to claim 15, the combination of Zabar, Rumswinkel, and the AAPA discloses the drive unit according to claim 14, as stated above, wherein the spring [40-45] comprises a leaf spring (figures 3 and 5; col. 4, lines 21-29 of Zabar).

With regard to claim 16, the combination of Zabar, Rumswinkel, and the AAPA discloses the drive unit according to claim 13, as stated above, further comprising a plurality of springs [40-45] disposed on each side of the center position (figures 3-4; col. 3, lines 60-67; each spring [40] comprises two leaf springs [44, 45]).

With regard to claim 17, Zabar, and the AAPA discloses the drive unit according to claim 13, as stated above, wherein the armature part [30] is connected to a plunger [3] of a compressor [4, 5, 6] (col. 2, line 62 through col. 3, line 3).

Except that Zabar does not expressly disclose that, in the center position of the armature part, the point of application of the spring on the armature part being displaced axially by a predetermined distance in relation to its clamping position, and the axial displacement of the point of application of the spring on the armature part being provided in the direction away from the compressor.

Rumswinkel discloses the drive unit according to claim 7, as stated above, where the armature part is displaced axially in relation to its clamping position.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the linear drive unit of Zabar by offsetting the

armature part away from the compressor as taught by Rumswinkel, for improving the efficiency thereof, since Rumswinkel teaches that such a drive unit minimizes the air gap between the magnetic components (see col. 1, lines 25-32).

With regard to claim 19, the combination of Zabar, Rumswinkel, and the AAPA discloses the drive unit according to claim 13, as stated above, wherein the armature part [30-34] includes two magnets [31-34] arranged symmetrically on each side of the yoke body [10, 20] in the center position (figure 3; col. 3, lines 36-40 of Zabar).

With regard to claim 20, Zabar discloses a linear drive unit [2] (figures 1-3) comprising:

a yoke body [10, 20] having an exciter winding [15, 25] providing a magnetic field (col. 3, lines 12-24);

a magnetic armature part [30-34] which is set in linear oscillating motion about a center position in an axial direction by the magnetic field of the winding (col. 3, lines 36-40), the center position being the equilibrium position where the center of the armature [30-34] is aligned with the center of the yoke body [10, 20] and/or windings [15, 25] thereof (figure 3; the armature is shown with the springs un-deflected); and

a spring [40-45] having a fixed end [42, 43] clamped in a fixed manner at a clamped position with respect to the yoke body [10 ,20] and an oscillating end [41] coupled to the armature part [30-34] at a point of application and acting on the armature part [30-34] in the direction of motion (col. 4, lines 30-36);

wherein the spring [40-45] is configured to be tensioned transverse to the direction of movement of the armature part (figures 3 and 5; col. 4, lines 21-29 of Zabar).

Except that Zabar does not expressly disclose that, when the armature part is at the center position, the point of application of the spring on the armature part is displaced axially by a predetermined distance in relation to the clamped position of the spring, or that when the armature part is at the equilibrium position the spring is pre-tensioned.

Rumswinkel discloses a linear drive unit (col. 1, lines 1-5 and figures 1-3) comprising a yoke body [1] having an exciter winding providing a magnetic field (see col. 1, lines 5-10), a magnetic armature part [2, 3] which is set in linear oscillating motion about a center position in an axial direction (reference [20] designates the direction of movement) by the magnetic field of the winding (col. 1, lines 10-19);

wherein, in the center position of the armature part [2, 3], the point of application [42] of the spring [4] on the armature part [2, 3] being displaced axially by a predetermined distance in relation to its clamping position [41] (figures 2-3; in its equilibrium position, the armature is displaced by distance [b]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the linear drive unit of Zabar by offsetting the armature part as taught by Rumswinkel, for improving the efficiency thereof, since Rumswinkel teaches that such a drive unit minimizes the air gap between the magnetic components (col. 1, lines 25-32).

The AAPA discloses that armature parts should be pre-tensioned laterally in the movement direction (see [0020]). It would have been obvious to one of ordinary skill in the art when the invention was made to implement the springs of Zabar by pre-tensioning them as taught by the AAPA, since pre-tensioning the springs was commonly known in linear drives used with compressors ([0020]).

With regard to claim 21, the combination of Zabar, Rumswinkel, and the AAPA discloses the drive unit according to claim 20, as stated above, wherein the spring [40-45] comprises a leaf spring (figures 3 and 5; col. 4, lines 21-29 of Zabar).

With regard to claim 22, the combination of Zabar, Rumswinkel, and the AAPA discloses the drive unit according to claim 20, as stated above, further comprising a plurality of springs [40-45] disposed on each side of the center position (figures 3-4; col. 3, lines 60-67; each spring [40] comprises two leaf springs [44, 45]).

With regard to claim 23, the combination of Zabar, Rumswinkel, and the AAPA discloses the drive unit according to claim 20, as stated above, wherein the armature part [30] is connected to a plunger [3] of a compressor [4, 5, 6] (col. 2, line 62 through col. 3, line 3).

Except that Zabar does not expressly disclose that, in the center position of the armature part, the point of application of the spring on the armature part being displaced axially by a predetermined distance in relation to its clamping position, and the axial displacement of the point of application of the spring on the armature part being provided in the direction away from the compressor.

Rumswinkel discloses the drive unit according to claim 7, as stated above, where the armature part is displaced axially in relation to its clamping position.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the linear drive unit of Zabar by offsetting the armature part away from the compressor as taught by Rumswinkel, for improving the efficiency thereof, since Rumswinkel teaches that such a drive unit minimizes the air gap between the magnetic components (see col. 1, lines 25-32).

With regard to claim 25, the combination of Zabar, Rumswinkel, and the AAPA discloses the drive unit according to claim 20, as stated above, wherein the armature part [30-34] includes two magnets [31-34] arranged symmetrically on each side of the yoke body [10, 20] in the center position (figure 3; col. 3, lines 36-40 of Zabar).

With regard to claim 26, the combination of Zabar, Rumswinkel, and the AAPA discloses the drive unit according to claim 7, as stated above, wherein the armature part [30-34] includes two magnets [31-34] arranged symmetrically on each side of the yoke body [10, 20] in the center position (figure 3; col. 3, lines 36-40 of Zabar).

6. Claims 11, 18, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zabar, Rumswinkel, and the AAPA as applied to claims 7, 13, and 20, respectively, above, and further in view of Howe (US 3,678,308).

With regard to claim 11, the combination of Zabar, Rumswinkel, and the AAPA discloses the drive unit according to claim 7, as stated above, except that the combination does not expressly disclose that the spring [40-45] has a spring constant

selected such that the characteristic frequency of the drive unit in cooperation with the total oscillating mass is lower than the frequency of the driving force.

Howe discloses a drive unit (figure 2) having a spring [52] whose spring constant is selected such that the characteristic frequency of the drive unit in cooperation with the total oscillating mass is lower than the frequency of the driving force (col. 1, lines 37-42; the driving force frequency, the "square wave", is twice that of the drive unit, the "scan frequency of the element").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the drive unit of Zabar by selecting the spring constant as taught by Howe, for determining the oscillation speed thereof, since Howe teaches that proper coordination of the spring with the natural frequency of the device prevents irregular movement when the device moves too quickly or slowly (col. 1, lines 25-36).

With regard to claim 18, the combination of Zabar, Rumswinkel, and the AAPA discloses the drive unit according to claim 13, as stated above, except that the combination does not expressly disclose that the spring [40-45] has a spring constant selected such that the characteristic frequency of the drive unit in cooperation with the total oscillating mass is lower than the frequency of the driving force.

Howe discloses a drive unit (figure 2) having a spring [52] whose spring constant is selected such that the characteristic frequency of the drive unit in cooperation with the total oscillating mass is lower than the frequency of the driving force (col. 1, lines 37-42;

the driving force frequency, the "square wave", is twice that of the drive unit, the "scan frequency of the element").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the drive unit of Zabar by selecting the spring constant as taught by Howe, for determining the oscillation speed thereof, since Howe teaches that proper coordination of the spring with the natural frequency of the device prevents irregular movement when the device moves too quickly or slowly (col. 1, lines 25-36).

With regard to claim 24, the combination of Zabar, Rumswinkel, and the AAPA discloses the drive unit according to claim 20, as stated above, except that the combination does not expressly disclose that the spring [40-45] has a spring constant selected such that the characteristic frequency of the drive unit in cooperation with the total oscillating mass is lower than the frequency of the driving force.

Howe discloses a drive unit (figure 2) having a spring [52] whose spring constant is selected such that the characteristic frequency of the drive unit in cooperation with the total oscillating mass is lower than the frequency of the driving force (col. 1, lines 37-42; the driving force frequency, the "square wave", is twice that of the drive unit, the "scan frequency of the element").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the drive unit of Zabar by selecting the spring constant as taught by Howe, for determining the oscillation speed thereof, since Howe teaches that proper coordination of the spring with the natural frequency of the device

prevents irregular movement when the device moves too quickly or slowly (col. 1, lines 25-36).

Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Andrews whose telephone number is (571)270-7554. The examiner can normally be reached on Monday through Thursday between the hours of 7:30 and 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quyen Leung can be reached at (571)272-8188. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tran N. Nguyen/

Primary Examiner, Art Unit 2834

/M. A./

Examiner, Art Unit 2834